CLAIMS

I/We claim:

[c1]   1.   A method for adaptive registration of a set of medical images corresponding to a patient, comprising:

estimating an amount of patient motion corresponding to the set of medical images; and

selectively performing an image resampling in accordance with an estimated amount of patient motion.

[c2]   2.   The method of claim 1, wherein estimating the amount of patient motion comprises performing a motion estimation procedure that involves patient motion in a directional axis corresponding to a lowest image resolution.

[c3]   3.   The method of claim 2, wherein the axis corresponds to an MRI slice thickness.

[c4]   4.   The method of claim 1, wherein estimating the amount of patient motion comprises performing one estimated motion procedure selected from the group of a two dimensional and a three dimensional motion estimation procedure in accordance with one motion model selected from the group of a rigid and a nonrigid motion model.

[c5]   5.   The method of claim 1, wherein selectively performing an image resampling comprises:

performing a comparison between the estimated amount of patient motion and a correction threshold; and

performing the image resampling based upon the comparison.

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[c6]   6.   The method of claim 5, wherein the correction threshold corresponds to a fraction of an image resolution.

[c7]   7.   The method of claim 6, wherein the fraction has a value approximately between 0.4 and 0.8.

[c8]   8.   The method of claim 6, wherein the fraction has a value of approximately 0.5.

[c9]   9.   The method of claim 5, wherein the correction threshold corresponds to a fraction of an image resolution along a lowest image resolution axis.

[c10]   10.   The method of claim 9, wherein the axis corresponds to an MRI image slice thickness.

[c11]   11.   The method of claim 16, wherein the set of medical images comprises a set of imaging signals, wherein an imaging signal may be characterized relative to a background imaging signal intensity, a precontrast imaging signal intensity corresponding to a lesion, and a postcontrast imaging signal intensity corresponding to the lesion, and wherein the fraction has a value that depends upon at least one from the group of a background imaging signal intensity, a precontrast imaging signal intensity, and a postcontrast imaging signal intensity.

[c12]   12.   The method of claim 5, wherein performing the image resampling comprises performing a first image resampling procedure in the event that the estimated amount of patient motion equals or exceeds the correction threshold and performing a second image resampling procedure in the event that the estimated amount of patient motion is less than the correction threshold.

[c13]   13.   The method of claim 5, wherein performing the image resampling comprises performing a three dimensional image resampling procedure in the event that the estimated amount of patient motion equals or exceeds the correction threshold.

[c14]   14.   The method of claim 5, wherein performing the image resampling comprises performing a two dimensional image resampling procedure in the event that the estimated amount of patient motion is less than the correction threshold.

[c15]   15.   A method for adaptive registration of a set of medical images corresponding to a patient, comprising:

estimating an amount of patient motion corresponding to the set of medical images;

performing a comparison between the estimated amount of patient motion and a correction threshold;

performing a three dimensional image resampling procedure in the event that the estimated amount of patient motion equals or exceeds the correction threshold; and

performing a two dimensional image resampling procedure in the event that the estimated amount of patient motion is less than the correction threshold.

[c16]   16.   The method of claim 15, wherein the correction threshold corresponds to a fraction of an image resolution.

[c17]   17.   The method of claim 16, wherein the fraction has a value between approximately 0.4 and 0.8.

[c18]   18.   The method of claim 16, wherein the fraction has a value of approximately 0.5.

[c19]   19.   The method of claim 15, wherein the correction threshold corresponds to a fraction of an image resolution along a lowest image resolution axis.

[c20]   20.   The method of claim 19, wherein the axis corresponds to an MRI image slice thickness.

[c21]   21.   The method of claim 15, further comprising the step of avoiding an image resampling in the event that the estimated amount of patient motion is less than the correction threshold by a predetermined amount.

[c22]   22.   A method for adaptive registration of a set of medical images corresponding to a patient, comprising:

estimating an amount of patient motion corresponding to the set of medical images;

performing a comparison between the estimated amount of patient motion and a correction threshold;

performing an image resampling procedure in the event that the estimated amount of patient motion equals or exceeds the correction threshold; and

avoiding an image resampling in the event that the estimated amount of patient motion is less than the correction threshold.

[c23]   23.   The method of claim 22, wherein the correction threshold corresponds to a fraction of an image resolution.

[c24]   24.   The method of claim 23, wherein the fraction has a value between approximately 0.4 and 0.8.

[c25]   25.   The method of claim 23, wherein the fraction has a value of approximately 0.5.

[c26]   26.   The method of claim 22, wherein the correction threshold corresponds to a fraction of an image resolution along a lowest image resolution axis.

[c27]   27.   The method of claim 26, wherein the axis corresponds to an MRI image slice thickness.

[c28]   28.   The method of claim 23, wherein the set of medical images comprises a set of imaging signals, wherein an imaging signal may be characterized relative to a background imaging signal intensity, a precontrast imaging signal intensity corresponding to the lesion, and a postcontrast imaging signal intensity corresponding to a lesion, and wherein the fraction has a value that depends upon at least one from the group of a background imaging signal intensity, a precontrast imaging signal intensity, and a postcontrast imaging signal intensity.

[c29]   29.   A system for adaptive registration of a set of medical images corresponding to a patient, comprising:

a processing unit; and

a computer readable medium containing program instructions to cause the processing unit to perform a comparison between an estimated amount of patient motion and a correction threshold; and select one from the group of performing a first image resampling procedure, performing a second image resampling procedure, and

avoiding an image resampling in accordance with a relationship between the estimated amount of patient motion and the correction threshold.

[c30]   30.   The system of claim 29, wherein the correction threshold corresponds to a fraction of an image resolution.

[c31]   31.   The system of claim 30, wherein the fraction has a value between approximately 0.4 and 0.8.

[c32]   32.   The system of claim 30, wherein the correction fraction has a value of approximately 0.5.

[c33]   33.   The system of claim 29, wherein the correction threshold corresponds to a fraction of an image resolution along a lowest image resolution axis.

[c34]   34.   The system of claim 33, wherein the axis corresponds to an MRI image slice thickness.

[c35]   35.   The system of claim 29, wherein selecting performing the first image resampling procedure comprises performing a three dimensional image resampling in the event that the estimated amount of patient motion equals or exceeds the correction threshold.

[c36]   36.   The system of claim 29, wherein selecting performing the second image resampling procedure comprises performing a two dimensional image resampling in the event that the estimated amount of patient motion is less than the correction threshold.

[c37]   37.   The system of claim 29, wherein selecting avoiding an image resampling comprises avoiding an image resampling in the event that the estimated amount of patient motion is less than the correction threshold by a predetermined amount.

[c38]   38.   The system of claim 29, further comprising:

a medical imaging system; and

a data storage device.

[c39]   39.   The system of claim 38, wherein the medical imaging system comprises an MRI system.

[c40]   40.   The system of claim 39, wherein the medical imaging system comprises a breast MRI system.

[c41]   41.   A computer readable medium storing program instructions to cause a processor to:

estimate an amount of patient motion corresponding to a set of medical images; and
select one from the group of performing a first image resampling procedure, performing a second image resampling procedure, and avoiding an image resampling in accordance with a relationship between an estimated amount of patient motion and the correction threshold.

[c42]   42.   The computer readable medium of claim 41, wherein the correction threshold comprises a fraction of an image resolution.

[c43]   43.   The computer readable medium of claim 41, wherein the fraction has a value between approximately 0.4 and 0.8.

[c44]   44.   The computer readable medium of claim 41, wherein the fraction has a value of approximately 0.5.

[c45]   45.   The computer readable medium of claim 41, wherein the correction threshold corresponds to a fraction of an image resolution along a lowest image resolution axis.

[c46]   46.   The method of claim 45, wherein the axis corresponds to an MRI image slice thickness.

[c47]   47.   The computer readable medium of claim 41, wherein selecting performing the first image resampling procedure comprises performing a three dimensional image resampling in the event that the estimated amount of patient motion equals or exceeds the correction threshold.

[c48]   48.   The computer readable medium of claim 41, wherein selecting performing the second image resampling procedure comprises performing a two dimensional image resampling in the event that the estimated amount of patient motion is less than the correction threshold.

[c49]   49.   The computer readable medium of claim 41, wherein selecting avoiding the image resampling comprises avoiding the image resampling in the event that the estimated amount of patient motion is significantly less than the correction threshold by a predetermined amount.